

Serial No. 10/615,926
Amendment Dated March 6, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. - 29. (Cancelled).

30. (New) A film forming apparatus, comprising:

a reaction vessel evacuated by an evacuation system, said reaction vessel being adapted to hold therein a substrate to be processed;

a source bottle holding therein a source material of a film to be formed on said substrate, said source bottle forming a source gas therein as a result of vaporizing caused by a vaporizing gas;

a vaporizing gas line supplying said vaporizing gas to said source bottle;

a source gas line supplying said source gas to said reaction vessel;

a diluting gas line connected to said source gas line at a node located between said source bottle and said reaction vessel;

a gas analyzer analyzing a concentration of said source gas flowing in said source gas line through a part thereof located between said node and said reaction vessel;

a first flow controller provided in said vaporizing gas line, said first flow controller controlling a flow rate of said vaporizing gas flowing through said vaporizing gas line;

Serial No. 10/615,926
Amendment Dated March 6, 2006

a second flow controller provided in said diluting gas line, said second flow controller controlling a flow rate of said diluting gas line flowing through said diluting gas line; and

a controller provided with an output from said gas analyzer and controlling, in response thereto, said first flow controller and said second flow controller, such that a difference between said concentration of said source gas and a target concentration of said source gas is decreased.

31. (New) The film forming apparatus as claimed in claim 30, wherein said source bottle holds said source material in the form of solid phase or liquid phase.

32. (New) The film forming apparatus as claimed in claim 30, wherein said vaporizing gas comprises an inert gas and said diluting gas comprises an inert gas.

33. (New) The film forming apparatus as claimed in claim 30, wherein said source gas flows through said source gas line together with said vaporizing gas as a carrier gas, said controller controlling said second flow controller, when controlling said first flow controller, such that a total flow rate in said source gas line is maintained constant.

34. (New) The film forming apparatus as claimed in claim 30, wherein said first flow controller comprises a first mass flow controller and said second flow controller comprises a second mass flow controller.

Serial No. 10/615,926
Amendment Dated March 6, 2006

35. (New) The film forming apparatus as claimed in claim 30, wherein said first flow controller comprises a mass flow controller, said diluting gas line comprises a bypass line branched from said vaporizing gas line between said mass flow controller and said source bottle and bypassing said source bottle, said second flow controller comprising a variable valve provided to said bypass line.

36. (New) The film forming apparatus as claimed in claim 30, wherein said gas analyzer is provided in line to said source gas line, such that said source gas is supplied to said reaction vessel through said gas analyzer.

37. (New) The film forming apparatus as claimed in claim 30, wherein said gas analyzer is provided parallel to said part of said gas line located between said node and said reaction vessel, an upstream end of said gas analyzer being connected to a corresponding upstream side of said part via a valve and a down stream end of said gas analyzer being connected to a corresponding downstream side of said part via a valve.

38. (New) The film forming apparatus as claimed in claim 30, further comprising a bypass gas line connected to said source gas line via a switching valve, said bypass gas line being connected to said evacuation system and bypassing said reaction vessel.

39. (New) The film forming apparatus as claimed in claim 30, wherein said gas analyzer is provided to said bypass gas line.

Serial No. 10/615,926
Amendment Dated March 6, 2006

40. (New) The film forming apparatus as claimed in claim 30, wherein said source material has a vapor pressure of 266Pa or less at a work temperature thereof.

41. (New) The film forming apparatus as claimed in claim 30, wherein said source gas comprises $W(CO)_6$.

42. (New) The film forming apparatus as claimed in claim 30, wherein said gas analyzer comprises a Fourier transform infrared spectrometer.

43. (New) The film forming apparatus as claimed in claim 30, further comprising: a manometer that measures a pressure inside said source gas line; and a processor correcting a concentration of said source gas analyzed by said gas analyzer based on said pressure.

44. (New) The film forming apparatus as claimed in claim 43, wherein said processor calculates an absolute concentration of said source gas.

45. (New) The film-formation apparatus as claimed in claim 44, wherein said processor multiplies a correction term, which includes said pressure at a denominator, to an output of said gas analyzer.

46. (New) The film-formation apparatus as claimed in claim 43, wherein said manometer is provided at any of an upstream side and a downstream side of said gas analyzer.

Serial No. 10/615,926
Amendment Dated March 6, 2006

47. (New) The film-formation apparatus as claimed in claim 30, wherein said gas analyzer measures said concentration of said source gas in said source gas line at a downstream side of a location where said diluting gas is admixed to said source gas.

48. (New) The film-formation apparatus as claimed in claim 30, wherein said source gas analyzer measures said concentration of said source gas in said source gas line at an upstream side of a location where said diluting gas is added to said source gas.

49. (New) The film-formation apparatus as claimed in claim 30, wherein said gas analyzer injects an infrared light to said source gas and produces an output signal based upon an infrared absorption spectrum of said infrared light passed through said source gas.

50. (New) The film-formation apparatus as claimed in claim 30, wherein said gas analyzer comprises a non-dispersion infrared spectrometer.

51. (New) A source supply system of a film forming apparatus, said film forming apparatus comprising a reaction vessel evacuated by an evacuation system, said source supply system comprising:

a source bottle holding therein a source material, said source bottle forming a source gas therein as a result of vaporizing caused by a vaporizing gas;
a vaporizing gas line supplying said vaporizing gas to said source bottle;
a source gas line supplying said source gas to said reaction vessel;

Serial No. 10/615,926
Amendment Dated March 6, 2006

a diluting gas line connected to said source gas line at a node located between said source bottle and said reaction vessel;

a gas analyzer analyzing a concentration of said source gas flowing in said source gas line through a part thereof located between said node and said reaction vessel:

a first flow controller provided in said vaporizing gas line, said first flow controller controlling a flow rate of said vaporizing gas flowing through said vaporizing gas line;

a second flow controller provided in said diluting gas line, said second flow controller controlling a flow rate of said diluting gas line flowing through said diluting gas line; and

a controller provided with an output from said gas analyzer and controlling, in response thereto, said first flow controller and said second flow controller, such that a difference between said concentration of said source gas and a target concentration of said source gas is decreased.